PHARMACY PRACTICE

Intravenous Admixture Workload in a Critical Care Pharmacy Satellite

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INTRODUCTION

Unit dose/intravenous admixture (UD/CIVA) services are recognized as the drug distribution system of choice in hospitals.[1,2] The Canadian Society of Hospital Pharmacists has recently published a document to assist in UD/CIVA proposal development and implementation.[3] Health and Welfare Canada has stated that if pharmacy is responsible for preparing intravenous (IV) admixtures for intensive care units (ICU), it is cost-effective to establish a satellite pharmacy in the ICU area.[1] The determination of workload and pharmacy staffing requirements to support this service is therefore an important issue that needs to be addressed. For CIVA services there are models available to project staffing needs; however, all of these models require an estimate of the total number of intravenous admixtures to be prepared.[4-9] An average figure for IV admixture workload for regular care beds has been stated as 0.75 units/patient day (may be doubled in teaching hospitals) and the small volume to large volume parenteral ratio has been reported to be 75/25.[8]

The purpose of this article is to report the IV admixture workload of a critical care pharmacy satellite and discuss the differences in IV workload for this specialty area.

The Toronto East General and Orthopaedic Hospital, a 600 bed acute care community hospital with teaching affiliation, opened a new 42 bed critical care wing in May, 1989. A satellite pharmacy provides all clinical and distribution services to ten surgical (SICU) and eight medical intensive (MICU) care beds, eight coronary care beds (CCU), sixteen intermediate (step-down) nursing care beds and the Emergency Department. Distribution services include providing intravenous admixtures to the 42 critical care beds. All large volume and small volume (minibags and syringes) parenterals are prepared by the pharmacy technicians. The IV admixture service also includes the labelling and dispensing of premixed IV solutions (eg., KCl, dopamine, lidocaine, aminophylline). A 24-hour supply of patient specific admixtures are prepared during the hours of service (0730 to 1930 hours daily) and small quantities of commonly used intravenous drugs are left in the medication rooms for use after closing. Workload measurement data is collected as outlined by the National Hospital Productivity Improvement Program Pharmacy Workload Measurement System.[9]

WORKLOAD STATISTICS

Prior to opening the critical care wing, CIVA services were not provided to the existing SICU and CCU; there were no MICU or stepdown beds. For the 12 month period of April 1, 1988 to March 31, 1989 prior to opening, a total of 140,559 large and small volume parenterals were prepared, representing 0.78 IV doses per patient day for the regular care beds with pharmacy CIVA services. In 1989, after opening the new wing, the number of critical care beds increased from the original 17 to a total of 42. Workload data for the first full fiscal year of operation of the critical care pharmacy satellite (April 1, 1990 to March 31, 1991) is presented in Table I to demonstrate the IV workload and the types of IV admixtures prepared.

Table I: 1990/91 IV Admixture Workload

Minibags	36,544
Large volume parenterals	22,711
Syringes	9,981
Total	69,236
Workload units	269,444
Patient days	12,153
IV/patient day	5.7

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DISCUSSION

The determination of staffing requirements for IV admixture services can be calculated using various workload models.[4-8] It is important, therefore, that assumptions made in the calculation of pharmacy manpower are reflective of the service. The number of IV doses prepared per patient day in this satellite are nearly eight times higher than the average number reported for regular care beds in non-teaching hospitals. For departments providing 24-hour services, the workload would be greater than the 12-hour service data provided in this report. The data demonstrate that IV workload for regular care beds cannot be extrapolated to critical care beds. In addition, since the ratio of LVP to SVP is higher and the workload unit value for LVP preparation is 63% higher than SVP preparation, it is suggested that hospitals considering IV admixture services for critical care units perform a detailed analysis of projected workload prior to establishing staffing requirements.

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